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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,093	03/26/2001	Fumio Takao	01178/LH	7731

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EXAMINER

CUEVAS, PEDRO J

ART UNIT PAPER NUMBER

2834

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/817,093

Applicant(s)

TAKAO ET AL.

Examiner

Pedro J. Cuevas

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 September 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.                      6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,438,232A to Inoue et al.

Inoue et al. clearly teaches the construction of a piezoelectric lamination actuator comprising:

a laminated structure (Figure 3) including a plurality of piezoelectric elements (2) and a plurality of internal electrodes (1) alternately stacked; and

a pair of external electrodes (11) connected alternately to said internal electrodes on respective opposite sides of said laminated structure, wherein each of said external electrodes comprises:

an electrode layer (4) formed on a side surface of said laminated structure by sputtering (column 4, lines 50-52); and

a first composite layer (6 + 12) formed on said electrode layer and made of a conductive resin including a first conductive material, Ni (column 5, lines 32-42).

4. With regards to claim 3, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,438,232A to Inoue et al. in view of U.S. Patent No. 4,786,837 to Kalnin et al.

Inoue et al. disclose the construction of a piezoelectric lamination actuator as described above.

However, it fails to disclose:

a pair of carbon papers respectively placed on said pair of external electrodes, wherein each of said external electrodes comprises:

an electrode layer formed on a side surface of said laminated structure,

a first composite layer formed on said electrode layer and made of a conductive resin including a first conductive material, and

wherein said carbon papers are placed on said first composite layers, and said electrode layers and said carbon papers are respectively adhered to each other by said first composite layers;

wherein said multilayer piezoelectric actuator device further comprises a second composite layer formed on each of said first composite layers, and said second composite layers are made of a conductive resin including a second conductive material and a carbon fiber.

Kalnin et al. teach the construction of a composite conformable sheet electrodes having:

a pair of carbon papers (column 5, lines 44-65) respectively placed on a pair of external electrodes, wherein each of said external electrodes comprises:

an electrode layer formed on a side surface of said laminated structure,  
a first composite layer formed on said electrode layer and made of a conductive resin including a first conductive material, and

wherein said carbon papers are placed on said first composite layers, and said electrode layers and said carbon papers are respectively adhered to each other by said first composite layers; and

wherein said multilayer piezoelectric actuator device further comprises a second composite layer formed on each of said first composite layers, and said second composite layers are made of a conductive resin including a second conductive material and a carbon fiber;

for the purpose of providing a method of making an electro-conductive composite sheet electrode which is conformable and in which a slit-and-expanded or perforated nickel screen is

embedded by heat and pressure, so that electrical leads can be easily and strongly attached to the nickel screen before or after integrally bonding a electro-conductive sheet electrode to each side of at least one adjacent piezoelectric ceramic/polymer composite sheet electrode which is non-conductive.

It would have been obvious to one skilled in the art at the time the invention was made to use the composite conformable sheet electrodes disclosed by Kalnin et al. on the piezoelectric lamination actuator disclosed by Inoue et al. for the purpose of providing a method of making an electro-conductive composite sheet electrode which is conformable and in which a slit-and-expanded or perforated nickel screen is embedded by heat and pressure, so that electrical leads can be easily and strongly attached to the nickel screen before or after integrally bonding a electro-conductive sheet electrode to each side of at least one adjacent piezoelectric ceramic/polymer composite sheet electrode.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,438,232A to Inoue et al. in view of U.S. Patent No. 4,786,837 to Kalnin et al. as applied to claims 4-7 above, and further in view of U.S. Patent No. 5,406,164 A to Okawa et al.

Inoue et al. in view of Kalnin et al. disclose the construction of a piezoelectric lamination actuator as described above.

However, it fails to disclose a first conductive material has at least one of a granular shape.

Okawa et al. teach the use of granular shaped material in the construction of a multilayer piezoelectric element for the purpose of forming the conductive portions (14) in the conductive film (13).

Art Unit: 2834

It would have been obvious to one skilled in the art at the time the invention was made to use the granular shaped material disclosed by Okawa et al. in the piezoelectric lamination actuator disclosed by Inoue et al. in view of Kalnin et al. for the purpose of forming a conductive portions in a conductive film.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,438,232A to Inoue et al. in view of U.S. Patent No. 5,406,164 A to Okawa et al.

Inoue et al. disclose the construction of a piezoelectric lamination actuator as described above.

However, it fails to disclose a first conductive material has at least one of a granular shape.

Okawa et al. teach the use of granular shaped material in the construction of a multilayer piezoelectric element for the purpose of forming the conductive portions (14) in the conductive film (13).

It would have been obvious to one skilled in the art at the time the invention was made to use the granular shaped material disclosed by Okawa et al. in the piezoelectric lamination actuator disclosed by Inoue et al. for the purpose of forming a conductive portions in a conductive film.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Art Unit: 2834

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramírez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas  
November 26, 2002



EXAMINER  
P. J. CUEVAS  
NOV 26 2002